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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,522	02/02/2001	Paul A. Farrar	M4065.0392/P392	6270

24998 7590 09/04/2003

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EXAMINER

TALBOT, BRIAN K

ART UNIT

PAPER NUMBER

1762

DATE MAILED: 09/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/773,522	Applicant(s) FARRAR ET AL.	
	Examiner Brian K Talbot	Art Unit 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 34-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 34-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

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1. The amendment filed 6/10/03 has been considered and entered. Claims 1-34 have been canceled. Claims 44-45 have been added. Claims 35-43 remain in the application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. Claim 35 and 36 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Farrar (6,136,689) or Knight et al. (5,629,838).

Farrar (6,136,689) teaches an ink jet printing head for depositing solder material for flip chip manufacture whereby the deposited solder has a diameter of less than 10 microns (col. 6, lines 31-50 and claims 29,30).

Knight et al. (5,629,838) teaches solder ball deposition for C4 technology whereby the solder balls are deposited with a diameter of 10-200 microns (col. 3, lines 1-20).

Claim Rejections - 35 USC § 103

4. Claims 37-39 and 43⁴⁵ are rejected under 35 U.S.C. 103(a) as being unpatentable over Farrar (6,136,689) or Knight et al. (5,629,838) in combination with Hayes (5,377,902) and Hayes (5,681,757).

Features described above are incorporated here.

Farrar (6,136,689) or Knight et al. (5,629,838) fail to teach the use of multiple heads to form the solder connections.

Hayes (5,681,757) teaches using multiple heads to form different solder coating or using multiple heads to form the solder connection with two different materials which are subsequently flowed together during the reflow process (col. 9, lines 29-55).

Hayes (5,377,902) teaches an ink jet printing head for depositing solder material for flip chip manufacture whereby the deposited solder has a diameter of less than 100 microns. Looking at Fig. 7, Hayes teaches forming multiple depositions of the solder in a single location (col. 6, line 37 – col. 7, line 8).

Therefore, it would have been obvious at the time the invention was made to have modified either Farrar (6,136,689) or Knight et al. (5,629,838) process by using multiple heads and multiple depositions as evidenced by Hayes (5,377,902) and Hayes (5,681,757).

Claims 37-39 and 43⁻⁴⁵ are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayes (5,377,902), Hayes et al. (5,229,016), Hieber (4,828,886) or Hayes et al. (MicroFab Technologies) in combination with Farrar (6,136,689) or Knight et al. (5,629,838).

Hayes (5,377,902), Hayes et al. (5,229,016), Hieber (4,828,886) or Hayes et al. (MicroFab Technologies) teach an ink jet printing head for depositing solder material for flip chip manufacture whereby the deposited solder has a diameter of less than 100 microns.

Hayes (5,377,902), Hayes et al. (5,229,016), Hieber (4,828,886) or Hayes et al. (MicroFab Technologies) fail to teach a diameter of the solder ball being less than about 10 microns.

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Farrar (6,136,689) or Knight et al. (5,629,838) both teach solder deposition of diameters of less than 10 microns.

Therefore, it would have been obvious at the time the invention was made to have modified Hayes (5,377,902), Hayes et al. (5,229,016), Hieber (4,828,886) or Hayes et al. (MicroFab Technologies) process by producing solder deposits having diameters less than 10 microns as evidenced by Farrar (6,136,689) or Knight et al. (5,629,838).

Claims 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farrar (6,136,689) in combination with Hayes (5,377,902) and Hayes (5,681,757) or Hayes (5,377,902), Hayes et al. (5,229,016), Hieber (4,828,886) or Hayes et al. (MicroFab Technologies) in combination with Farrar (6,136,689) or Knight et al. (5,629,838).

Features described above are incorporated here.

Farrar (6,136,689) or Knight et al. (5,629,838) in combination with Hayes (5,377,902) and Hayes (5,681,757) or Hayes (5,377,902), Hayes et al. (5,229,016), Hieber (4,828,886) or Hayes et al. (MicroFab Technologies) in combination with Farrar (6,136,689) or Knight et al. (5,629,838) fail to teach cleaning the pad prior to solder deposition and applying an adhesive and/or a passivation layer.

While the Examiner acknowledges that fact that the references are silent upon these limitations, it is the Examiner's position that these features are commonplace in the art and would have been within the skill of a practitioner in the art to have been utilized with the well known expected advantages associated therewith.

Response to Amendment

5. Applicant's arguments with respect to claims 35-43 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argued that the prior art failed to teach solder deposits of less than about 10 microns.

Farrar (6,136,689) or Knight et al. (5,629,838) teach such limitations as noted above.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K Talbot whose telephone number is (703) 305-3775. The examiner can normally be reached on Monday-Friday 6AM-3PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3775.

Brian K Talbot
Primary Examiner
Art Unit 1762

BKT
August 15, 2003